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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,060	07/09/2003	Harris A. Reynolds JR.	09432/246002	9532

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Houston, TX 77010

EXAMINER

AFTERGUT, JEFF H

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,060

Applicant(s)

REYNOLDS ET AL.

Examiner

Jeff H. Aftergut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11,13-18 and 21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11,13-18 and 21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11, 13-17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Japanese Patent 3-260413 optionally further taken with Yates et al.

The admitted prior art suggested that it was known at the time the invention was made to form a wound fiber reinforced plastic tubing by a process which included provision of a inner impermeable plastic liner (which was typically formed from thermoplastic) and the winding of a plurality of layers of fiber impregnated with resin about the liner. The fibers which are wound in a helical pattern over the liner are formed from a hybrid blend of half by volume glass and half by volume carbon fibers in order to provide the desired flexibility and stiffness needed for the tubing. The admitted prior art failed to teach or suggest that this tubing was provided the tubing with an interior layer of glass fiber layer wherein the interior layer was formed only of the glass fibers and then one applied the additional layers of the hybrid material (glass and carbon) onto the same. It should be noted that the wound tubing of the prior art was known to have been a substitute for steel tubing.

Japanese Patent '413 suggested that it was known at the time the invention was made to provide an inner and exterior layer of glass fibers. The reference suggested

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that onto the interior layer of glass fibers one would have wound a hybrid layer of two or more kinds of reinforcing fibers. The reference suggested that the hybrid layers were applied at a helical angle of 10 to 45 degrees in both directions. The reference suggested that such processing allowed for the manufacture of a drive shaft made from fiber reinforced plastic that has sufficient strength and high modulus of elasticity in the axial direction. Additionally by providing the innermost layer as a glass fiber layer, the reference to Japanese Patent '413 suggested that the drive shaft was protected against deterioration due to electrolytic corrosion. Clearly, when making a tubing from fiber reinforced plastic material which included hybrid layers of different fiber materials, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate an inner layer of wound glass fibers in order to provide protection against corrosion as suggested by Japanese Patent 3-260413 in the process of making a hybrid tube which included winding a hybrid layer of different fibers about the tube as suggested by the applicant's admitted prior art.

With regard to claim 13, note that the admitted prior art suggested that those skilled in the art would have employed a plastic tubing of thermoplastic for the liner. Regarding claim 14, note that Japanese Patent '413 suggested that the fiber material for the interior was a glass fiber layer. Regarding claim 15, note that the reference to Japanese Patent '413 suggested that the inner layer was a glass fiber layer. Regarding claim 16, note that the admitted prior art suggested that the hybrid layer typically would have included 50% by volume of glass and carbon fibers. Regarding claim 17, note that the resin employed in the admitted prior art was a thermosetting resin which was cured

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via the application of heat. Regarding claim 21, note that the admitted prior art suggested that the winding operation would have involved the application of resin to the fibers prior to the winding operation. Such is taken as conventional as a wet winding operation or as an operation which included winding preimpregnated filaments upon the mandrel as such it would have been within the purview of the ordinary artisan to utilize such conventional operations in the processing of making the tubing.

While it is believed that one skilled in the art would have understood that the techniques of Japanese patent '413 would have been useful in the admitted prior art, to further evidence that the drive shafts of Japanese Patent '413 would have been relevant to the tubing of the admitted prior art, the reference to Yates is cited. Yates suggested that fiber reinforced plastic shafts which were formed into drive shafts would have been a suitable replacement for known steel shafts in the prior art, see column 1, line 67- column 2, line 4. It should be noted that the applicant's admitted prior art expressly stated that the composite tubes were replacements for steel tubes. Clearly, as the reference to Japanese Patent '413 was manufacturing a drive shaft, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the inner layer of glass fibers on the wound product as suggested by Japanese Patent 03-260413 when making a drive shaft which was a substitute for a steel shaft as suggested by Yates in the process of making a substitute tubing for a steel shaft of the admitted prior art.

3. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Japanese Patent 3-260413 and Yates et al.

The admitted prior art and Japanese Patent '413 are described in full detail above and applicant is referred to the same for a complete discussion of the same. The references failed to teach that those skilled in the art would have understood that a thermoplastic material would have been suitable resin matrix for the fiber reinforced composite tube but rather selected a thermosetting material which was cured as the matrix material for the composite. The applicant is advised, however, that one skilled in the art of manufacturing a tubular article which was a substitute for a steel tube, would have known that the matrix material employed in the operation would have been a thermoplastic resin material as an alternative to a thermosetting resin material as suggested by Yates et al. Applicant is more specifically referred to column 3, lines 50-54, column 1, line 67-column 2, line 4. the reference made it clear that those skilled in the art would have incorporated a thermoplastic resin as an alternative to the thermosetting resin materials described by the admitted prior art and Japanese Patent '413. It should be noted that in order to form a composite from a thermoplastic resin matrix, one skilled in the art would have understood that the matrix material would have been heat consolidated and such it taken as conventional in the art of making composite articles from thermoplastic resin impregnated fiber reinforced materials (much as the artisan was well aware of the need to heat cure thermosetting resins). It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the thermoplastic matrix material of Yates et al when making an alternative tube for substitution with a steel tubing such as a drive shaft which included

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an interior layer of just glass fibers as suggested by Japanese Patent 3-260413 and the applicant's admitted prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:15-345 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeff H. Aftergut
Primary Examiner
Art Unit 1733

JHA
September 6, 2005